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(54) INFORMATION OUTPUT DEVICE, RECORDER, INFORMATION DUPLICATION PREVENTION CONTROL METHOD AND RECORDING MEDIUM

(57)Abstract:

PROBLEM TO BE SOLVED: To prevent the deletion and correction of duplication prevention control information with replacement of a frequency filter and an information signal by spectrum-spreading the duplication prevention control information based on additive information obtained from a recording medium, superimposing it on a main information signal reading this duplication prevention control information out, superimposing the relevant control information on the main information signal with another superposition system and outputting the main information signal containing two copy prevention control information.

SOLUTION: A digital regenerative video component S2 is extracted from a regenerative signal S1, and is decoding processed in a decoding part 12, and the duplication prevention control signal is decoded. The signal S4 superimposing the

duplication prevention control signal on the signal S3 by a copy prevention control signal addition part 13 is analog converted by a D/A converter 14 to be made the signal S5. On the other hand, the duplication prevention control signal S6 extracted from the signal S2 by a copy prevention control signal extraction part 16 is spectrum-spread by an SS duplication prevention control signal generation part 17 to obtain an SS duplication prevention control signal S7. The signal S8 obtained by D/A-converting the signal S7 is superimposed on the signal S5 by an adder 15.

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CLAIMS

[Claim(s)]

[Claim 1] Based on the additional information acquired from the record medium, spectrum diffusion of the duplicate prevention control information is carried out. The 1st duplicate prevention control information superposition means superimposed on the main information signal which read said this duplicate prevention control information that carried out spectrum diffusion from said record medium, and was reproduced, It is the method with which said 1st duplicate prevention control information superposition means differ said duplicate prevention control information. The duplicate prevention control information on which it was superimposed by the 2nd duplicate prevention control information superposition means superimposed on said main information signal, and said 1st duplicate prevention control information

superposition means, The information output unit characterized by having a means to output the main information signal including both duplicate prevention control information on which it was superimposed by said 2nd duplicate prevention control information superposition means.

[Claim 2] While spectrum diffusion is carried out and the main information signal is overlapped on duplicate prevention control information It is equipment which receives the signal superimposed on said duplicate prevention control information by said main information signal with other methods as an input signal. The 1st duplicate prevention control information extract means which extracts said duplicate prevention control information by which spectrum diffusion is carried out from said main information signal by reverse spectrum diffusion, said -- others -- with two or more 1 thru/or 2nd duplicate prevention control information extract means to extract the duplicate prevention control information on which it is superimposed by the method, respectively A selection means to select the information nearest to the ban on a duplicate as output duplicate prevention control information from two or more duplicate prevention control information from said 1st duplicate prevention control information extract means and said 2nd duplicate prevention control information extract means, A recording device equipped with the record control means which performs record control of said main information signal based on said output duplicate prevention control information selected by this selection means.

[Claim 3] It is the recording device according to claim 2 which said duplicate prevention control information shows the count of a duplicate permitted, and is characterized by said selection means selecting the fewest information on the count of a duplicate permitted as output duplicate prevention control information.

[Claim 4] The recording device according to claim 2 characterized by recording the duplicate prevention control information selected with said selection means as digital additional information when recording said main information signal on a record medium in the state of a digital signal.

[Claim 5] The recording device according to claim 2 characterized by superimposing and recording the duplicate prevention control information selected with said selection means on said main information signal by the method besides the above while carrying out spectrum diffusion of the duplicate prevention control information selected with said selection means and superimposing and recording on said main information signal, when recording said main information signal on a record medium in the state of an analog signal.

[Claim 6] In the approach of receiving the main information signal which spectrum diffusion is carried out and includes the duplicate prevention control information on which it was superimposed, and the duplicate prevention control information on which it was superimposed by other superposition methods, and recording on a record medium The 1st extract process which extracts said duplicate prevention control information by which spectrum diffusion is carried out from said main information

signal by reverse spectrum diffusion, The 2nd extract process which extracts said duplicate prevention control information on which it is superimposed by the superposition method besides the above from said main information signal, The selection process which selects the information nearest to the ban on a duplicate from the inside of the duplicate prevention control information extracted at said 1st extract process, and the duplicate prevention control information extracted at said 2nd process as output duplicate prevention control information, The information duplicate prevention control approach characterized by having the record control process of performing record control of said main information signal based on said output duplicate prevention control information selected by this selection process. [Claim 7] The record medium with which the main information signal with which it was superimposed on the duplicate prevention control information by which spectrum diffusion was carried out, and the duplicate prevention control information by other superposition methods was recorded in the condition of an analog signal.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention reproduces the information signal currently recorded on the record medium, and transmits a duplicate with the information (duplicate prevention control information) which carries out prevention control, and when receiving this transmitted information signal and recording to another record medium, it is related to the record medium use it to the approach of enabling it to carry out duplicate prevention control certainly by said duplicate prevention control information, equipment, and this.

[0002]

[Description of the Prior Art] VTR (video tape recorder) spreads and much reproducible software is increasingly offered with VTR. Moreover, recently, digital VTR, the regenerative apparatus of DVD (digital videodisc), etc. are actual, and it reproduces easily, and can view now and listen to the good image of image quality and tone quality, and voice.

[0003] However, there is a problem that there is a possibility that the software with which is one side and abundance came to be provided in this way may be reproduced without any restriction, and various duplicate preventive measures are given from the former.

[0004] For example, although it is not the approach of forbidding the duplicate about an analog video signal directly, there is a method of preventing a duplicate

substantially using a difference of VTR as a recording device and the method of AGC (automatic gain control) of a monitor receiving set which offers an image, or a difference of the property of APC (auto phase control).

[0005] For example, VTR performs AGC with the false synchronizing signal inserted in the video signal. Namely, a monitor receiving set The method of using a difference of the method of AGC as the AGC method by this false synchronizing signal is adopted in the former example When recording an analog video signal on an original record medium, the false synchronizing signal with extremely big level as a synchronizing signal for AGC is inserted. A false synchronizing signal with this extremely big level is inserted in the video signal supplied to VTR for record from VTR for playback as a synchronizing signal for AGC.

[0006] VTR performs APC with the phase of the color burst signal in a video signal itself. Moreover, a monitor receiving set The method of using a difference of the property of APC is the latter example as this adopts a different APC method. When recording an analog video signal on an original record medium, the phase of the color burst signal of a video signal is reversed partially, and the phase of a color burst signal outputs what was reversed partially as a video signal supplied to VTR for record from VTR for playback.

[0007] An image is reproduced normally, without being influenced in the monitor receiving set which receives supply of the analog video signal from VTR for playback of the partial phase reversal of the color burst signal used for a false synchronizing signal or APC, when it is made above.

[0008] However, the false synchronizing signal was inserted as mentioned above from VTR for playback, or in response to supply of the analog video signal which received phase inversion control of a color burst signal, in VTR which records this on a record medium, gain control based on an input signal or phase control cannot be performed normally, but a video signal can be normally recorded no longer. Therefore, even if it reproduces the recorded video signal, it can avoid reproducing the normal image to which it can view and listen.

[0009] Thus, when treating an analog video signal, a duplicate is not forbidden, but the playback image to which it can view and listen is made not to be acquired normally, and, so to speak, this is negative duplicate prevention control.

[0010] On the other hand, in treating, the digitized information, for example, the video signal, it is made to perform direct duplicate prevention control of forbidding a duplicate by adding the duplicate prevention control signal which consists of a duplicate prevention sign or a generation limit sign of a duplicate to a video signal as digital data, and recording it on the record medium.

[0011] Drawing 11 is the fundamental block diagram of the duplicate equipment in the case of treating this digitized information, delivery and the thing which can be reproduced perform a duplicate for the digital information reproduced with the digital regenerative apparatus 110 to digital storage equipment 120 through the digital

transmission way 101, and the thing of duplicate disapproval forbids a duplicate.

[0012] In addition to digital main information, the duplicate prevention control information as additional information is recorded on the record medium 111 with which the digital regenerative apparatus 110 is loaded. This duplicate prevention control information directs the ban on a duplicate, duplicate authorization, a generation limit, etc. as contents of control. The digital playback section 112 reads information from a record medium 111, acquires duplicate prevention control information with digital main information, and sends this to digital storage equipment 120 through the digital transmission way 101.

[0013] The duplicate prevention control signal detecting element 122 of digital storage equipment 120 detects a duplicate prevention control signal from the information received through the digital transmission way 101, and distinguishes the contents of control. And this distinction result is sent to the digital storage section 121.

[0014] When the distinction result of the duplicate prevention control signal from the duplicate prevention control signal detecting element 122 is what permits record of the digital information inputted through the digital transmission way 101, the digital storage section 121 changes said input digital signal into the digital information suitable for record, writes it in a record medium 123, and is made to perform record. On the other hand, when the distinction result of the duplicate prevention control signal from the duplicate prevention control signal detecting element 122 is the ban on a duplicate, the digital storage section 121 is made not to perform record processing of said input digital information.

[0015] furthermore, when the distinction result of the duplicate prevention control signal from the duplicate prevention control signal detecting element 122 is what permits only the 1st-generation duplicate While the digital storage section 121 changes said input digital signal into the digital information suitable for record, writing in a record medium 123 and performing record The duplicate prevention control signal as additional information is changed into what directs the ban (ban on a next-generation duplicate) on a duplicate, and it is made to record on a record medium 123. Therefore, a video signal can be reproduced no longer if the reproduced record medium 123 is used.

[0016] Thus, in the so-called digital connection supplied to a recording apparatus by making the main information signal and the duplicate prevention control signal as additional information into a digital signal, since a duplicate prevention control signal is included in the digital data transmitted, in a recording apparatus, duplicate prevention control of the ban on a duplicate etc. can be ensured using this duplicate prevention control signal.

[0017]

[Problem(s) to be Solved by the Invention] By the way, in order to act as the monitor of the video signal and sound signal which were reproduced in the case of digital VTR, only the video signal and sound signal which are the main information signal are

changed into an analog signal through the D/A conversion circuit 113, and it is made for the digital regenerative apparatus of drawing 11 to derive to the analog output terminal 114 to which a monitor receiving set is usually connected.

[0018] Thus, even if it is the regenerative apparatus of digital information, the duplicate prevention control signal is not included in the analog signal drawn by the analog output terminal 114. For this reason, when it is the analog connection to which Analog VTR etc. is connected to an analog output terminal 114, the duplicate of an information signal will be attained.

[0019] Then, although it is possible to carry out superposition addition of the duplicate prevention control signal to the video signal by which D/A conversion was carried out, or a sound signal, it is difficult to add a duplicate prevention control signal, to take out in a recording device, without degrading the video signal and sound signal by which D/A conversion was carried out, and to use for duplicate prevention control.

[0020] Therefore, in analog connection, the approach only had conventionally that it was made to perform negative duplicate prevention using the duplicate prevention approach of using a difference of the method of AGC of VTR mentioned above and a monitor receiving set, or a difference of the property of APC.

[0021] However, in the case of the duplicate prevention control approach of using a difference of the method of AGC of VTR mentioned above and a monitor receiving set, or a difference of the property of APC, depending on the method of AGC by the side of a recording device, and the property of APC, record of a video signal will be performed normally, and the case where even negative duplicate prevention cannot be performed occurs. Moreover, there was also a possibility that problems, like the playback image of a monitor receiving set is confused might arise.

[0022] These people did spectrum diffusion of the duplicate prevention control signal, superimposed this duplicate prevention control signal that carried out spectrum diffusion on the video signal of the condition of an analog signal, and have propose previously digital storage or the method record the account of an analog in a video signal as an effective duplicate prevention control system in any [of analog connection and digital connection] case, without solve the above troubles and degrade the image and the voice reproduce (refer to Japanese Patent Application No. No. 339959 [seven to]).

[0023] In this method, the sign (henceforth a PN code) of PN (PseudorandomNoise) sequence used as a diffusion sign is generated a period early enough, spectrum diffusion is carried out by multiplying this to a duplicate prevention control signal, and a narrow-band and the duplicate control signal of a high level are transformed to the signal of the broadband and low which affect neither a video signal nor a sound signal. And this duplicate prevention control signal by which spectrum diffusion was carried out is superimposed on an analog video signal, and it is made to record on a record medium. In this case, an analog and digital either are possible for the video signal recorded on a record medium.

[0024] In this method, since spectrum diffusion is carried out and a duplicate prevention control signal is superimposed by the video signal as a signal of a broadband and a low, it is difficult for those who are going to reproduce illegally removing the duplicate prevention control signal on which it was superimposed from a video signal.

[0025] However, it is possible by carrying out reverse spectrum diffusion to detect and use the duplicate prevention control signal on which it was superimposed. Therefore, while being able to provide a recording device side with a duplicate prevention control signal certainly with a video signal, duplicate control according to the duplicate prevention control signal which detected and detected the duplicate prevention control signal to the recording device side can be ensured.

[0026] However, as mentioned above, it is theoretically possible to remove the duplicate prevention control signal on which spectrum diffusion was carried out and the video signal was overlapped from a video signal, although it is difficult.

[0027] For example, when the duplicate prevention control signal by which spectrum diffusion was carried out is fixed level, it receives, before supplying this video signal to a recording apparatus, and the duplicate prevention control signal on which the video signal is overlapped and by which spectrum diffusion was carried out is detected using slide correlator etc. And it is possible in eliminating the duplicate prevention control signal on which spectrum diffusion is carried out and the video signal is overlapped by generating the duplicate prevention control signal on which spectrum diffusion is carried out and the video signal is overlapped, and this level and a denial signal in phase based on the detected duplicate prevention control signal, and deducting this from the video signal with which it was superimposed on the duplicate prevention control signal by which spectrum diffusion was carried out.

[0028] For this reason, by eliminating the duplicate prevention control signal on which the video signal was overlapped, the duplicate of the image to which the duplicate is forbidden is attained and it is thought that there is a possibility that illegal reproduction of an image may be performed.

[0029] Moreover, in the analog connection which was mentioned above in the case of the record medium on which the duplicate prevention control signal is recorded with the video signal by other methods instead of the record medium with which the video signal was overlapped on the duplicate prevention control signal by which spectrum diffusion was carried out in this way, duplicate prevention control is difficult as mentioned above.

[0030] This invention aims at offering the equipment, approach, and record medium which can improve the above trouble.

[0031]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, it sets to this invention. Based on the additional information acquired from the record medium, spectrum diffusion of the duplicate prevention control information

is carried out. The 1st duplicate prevention control information superposition means superimposed on the main information signal which read said this duplicate prevention control information that carried out spectrum diffusion from said record medium, and was reproduced, It is the method with which said 1st duplicate prevention control information superposition means differ said duplicate prevention control information. The duplicate prevention control information on which it was superimposed by the 2nd duplicate prevention control information superposition means superimposed on said main information signal, and said 1st duplicate prevention control information superposition means, The information output unit characterized by having a means to output the main information signal including both duplicate prevention control information on which it was superimposed by said 2nd duplicate prevention control information superposition means is offered.

[0032] Since an analog information signal is overlapped on the duplicate prevention control information which carried out spectrum diffusion in case the signal which reads said main information signal from this record medium, and is transmitted to a recording device is generated according to this information output unit, even if the duplicate prevention control information by which spectrum diffusion was carried out is not recorded on a record medium, even if it is the case of analog connection, effective duplicate prevention control can be performed.

[0033] And even if the duplicate prevention control information by which spectrum diffusion was carried out is eliminated before it is inputted into a recording device, the duplicate prevention control information on which it was superimposed by other superposition methods exists, and duplicate prevention control at the time of record can be performed by the duplicate prevention control information.

[0034] Thus, when two or more kinds of duplicate prevention control information exists, the time of the contents of control which each duplicate prevention control information directs differing poses a problem. However, it sets to the recording device by this invention. The 1st duplicate prevention control information extract means which extracts said duplicate prevention control information by which spectrum diffusion is carried out from said main information signal by reverse spectrum diffusion, said -- others -- with two or more 1 thru/or 2nd duplicate prevention control information extract means to extract the duplicate prevention control information on which it is superimposed by the method, respectively A selection means to select the information nearest to the ban on a duplicate as output duplicate prevention control information from two or more duplicate prevention control information from said 1st duplicate prevention control information extract means and said 2nd duplicate prevention control information extract means, It has the record control means which performs record control of said main information signal based on said output duplicate prevention control information selected by this selection means.

[0035] Thus, according to the recording device by this invention, adjustment between two or more duplicate prevention control information is performed by selecting the

information nearest to the ban on a duplicate as output duplicate prevention control information. Therefore, even if one of duplicate prevention control information will be changed before the input to a recording device, and mismatching arises among two or more duplicate prevention control information which should be the same essentially, suitable duplicate prevention control can be performed.

[0036]

[Embodiment of the Invention] Hereafter, the gestalt of implementation of this invention is explained, referring to drawing.

[0037] The information duplicate prevention control approach according [the information duplicate prevention system formed by the information output unit and recording device of a gestalt of the operation explained below] to this invention is applied. And in the gestalt of the operation explained below, both an information output unit and a recording apparatus are explained as what was applied to the record regenerative apparatus (it is called DVD equipment below) of DVD (digital videodisc). In addition, in order to simplify explanation, the explanation about a sound signal system is omitted.

[0038] [the gestalt of the 1st operation] -- the gestalt of this 1st operation is the case where the video signal and sound signal which were digitized are recorded on the disk which is a record medium, and only one kind of duplicate prevention control signal is recorded as additional information. A duplicate prevention control signal is also recordable on the track area called TOC (Table Of Contents) of the most inner circumference of this disk, and a directory, on the track with which image data and voice data are recorded, it can set aside record area and insertion record can also be carried out. The example explained below is an example in the case of the latter, and when image data are read, it is the case where a duplicate prevention control signal is also read to coincidence.

[0039] In the gestalt of this 1st operation, such a record medium is reproduced, and in order to perform effective duplicate prevention control in the analog connection to which that regenerative signal is changed into an analog signal, and is supplied to a recording device, an information output unit as shown in drawing 1 is used as equipment which performs playback from DVD.

[0040] Drawing 1 is drawing for explaining the information output unit 10 of the gestalt of this 1st operation. The information output unit 10 is equivalent to the reversion system of DVD equipment in the gestalt of this 1st operation.

[0041] In the gestalt of this operation, a duplicate prevention control signal is information which shows the count of permission of the duplicate of a video signal, and when the count of duplicate authorization is 0, it is the ban on a duplicate. In this example, as mentioned above, insertion addition of this duplicate prevention control signal is carried out at image data. The information output unit 10 is loaded with a disk 100, and the signal currently recorded by the read-out demand is read.

[0042] As shown in drawing 1 , the information output unit 10 of the gestalt of this

operation is the read-out section 11, the decryption section 12, the duplicate prevention control signal adjunct 13, D/A converter 14, an adder unit 15, the duplicate prevention control signal extract section 16, and SS (it is here and SS is the abbreviation for spectrum diffusion.). It has the same duplicate prevention control signal generation section 17, D/A converter 18, and the timing generation section 19 below.

[0043] The read-out section 11 takes out the digital playback video-signal component S2 from the signal S1 which reproduces the information currently recorded on the disk 100 and is acquired, and supplies this to the decryption section 12 and the duplicate prevention control signal extract section 16.

[0044] The decryption section 12 decodes the duplicate prevention control signal included in image data, and supplies the decrypted signal S3 to the duplicate prevention control signal adjunct 13 while it performs decryption processing about the digital playback video-signal component S2. Also when it changes into an analog signal, this duplicate prevention control signal adjunct 13 adds the duplicate prevention control signal concerned, and superimposes a duplicate prevention control signal within the perpendicular blanking period of the video signal before D/A conversion in this example as the video signal is overlapped on the duplicate prevention control signal.

[0045] Signal S4 from this duplicate prevention control signal adjunct 13 is supplied to D/A converter 14, and the analog video signal S5 including a Vertical Synchronizing signal and a Horizontal Synchronizing signal is acquired from this D/A converter 14. This analog video signal S5 is supplied to the timing generation section 19 while it is supplied to an adder unit 15.

[0046] The timing generation section 19 generates a clock signal and various kinds of timing signals in response to supply of the analog video signal S5 from D/A converter 14, using the image synchronizing signal in this analog video signal S5 as a reference signal.

[0047] Drawing 2 is the block diagram showing the example of a detail configuration of this timing generation section 19. As shown in drawing 2, the timing generation section 19 is equipped with the criteria timing detecting element 191, the PLL circuit 192, and the timing signal generation section 193.

[0048] The criteria timing detecting element 191 extracts the image synchronizing signal as a criteria timing signal from the analog video signal S3 from D/A converter 33. In the gestalt of this operation, using Vertical Synchronizing signal VD as a criteria timing signal, the criteria timing detecting element 191 extracts Vertical Synchronizing signal VD, and supplies this to the PLL circuit 192 and the timing signal generation section 193.

[0049] The PLL circuit 192 generates the clock signal CLK which synchronized with Vertical Synchronizing signal VD. This clock signal CLK is supplied to the duplicate prevention control signal extract section 16, SS duplicate prevention control signal

generation section 17, D/A converter 18, etc., respectively while it is supplied to the timing signal generation section 193.

[0050] The timing signal generation section 193 generates and outputs the reset signal (initialization signal) RE of the PN code generating section 172 mentioned later, and various kinds of other timing signals based on Vertical Synchronizing signal VD and a clock signal CLK. In the gestalt of this operation, a reset signal RE synchronizes with Vertical Synchronizing signal VD, and is generated as a signal which makes the 1 perpendicular section one period.

[0051] The duplicate prevention control signal extract section 16 extracts the duplicate prevention control signal S6 out of the information data stream of the playback video-signal component S2 taken out by the read-out section 11, and supplies this to SS duplicate prevention control signal generation section 17.

[0052] SS duplicate prevention control signal generation section 17 generates PN (Pseudorandom Noise; pseudo-random noise) sign train, and carries out spectrum diffusion of the duplicate prevention control signal S6 using this PN code train.

[0053] Drawing 3 is drawing showing the example of a configuration of SS duplicate prevention control signal generation section 17 of the gestalt of this operation. As shown in drawing 3, SS duplicate prevention control signal generation section 17 is equipped with the duplicate prevention control signal train generation section 171, the PN code train generation section 172, and a multiplier 173.

[0054] A clock signal CLK, and the duplicate prevention control signal S6 and timing signal T1 from the duplicate prevention control signal extract section 16 from the timing generation section 19 are supplied to the duplicate prevention control signal train generation section 171. In this case, a timing signal T1 shows the timing of the break in every bit of the duplicate prevention control signal S6.

[0055] And by [which output several clock minutes] the ability having decided the duplicate prevention control signal S6 beforehand for every bit, the duplicate prevention control signal train generation section 171 generates the duplicate prevention control signal train FS, and supplies this to a multiplier 173. The duplicate prevention control signal train FS of a low bit which directs the count of duplicate authorization is generated for the every case of this example, for example, the section of 1 perpendicular period.

[0056] The clock signal CLK which synchronized with the Vertical Synchronizing signal of the video signal from the timing generation section 19, and a reset signal (initialization signal) RE are supplied to the PN code train generation section 172. An enable signal EN is a signal for making the PN code train generation section 172 into operating state, the gestalt of this operation sets it, is generated by supplying a power source to the information output unit 10, and is supplied to the PN code train generation section 172. A reset signal RE is a signal for making the PN code train which has the sign pattern decided beforehand generate from the head.

[0057] According to an enable signal EN, it changes the PN code train generation

section 172 into the condition that it can operate. And the PN code train generation section 172 generates a PN code train from the head for every timing to which the reset signal RE was supplied synchronizing with a clock signal CLK. The generated PN code train PS is supplied to a multiplier 173.

[0058] Drawing 4 is drawing showing the example of a configuration of the PN code train generation section 172. The PN code train generation section 172 of this example consists of 15 D flip-flops REG1-REG15 which constitute 15 steps of shift registers, and IKUSUKURUSHIBUOA circuit EX-OR1 which calculates the proper tap output of this shift register - EX-OR5. And the PN code train generation section 172 shown in drawing 3 generates the PN code train PS of an M sequence based on reset-signal RE, clock signal CLK, and an enable signal EN, as mentioned above.

[0059] The multiplication section 173 of SS duplicate prevention control signal generation section 17 carries out spectrum diffusion of the duplicate prevention control signal train FS using the PN code train PS from the PN code train generation section 172. The spectrum diffusion signal (henceforth SS duplicate prevention control signal) S7 which is a duplicate prevention control signal by which spectrum diffusion was carried out is acquired from this multiplication section 173.

[0060] As mentioned above, it sets in the gestalt of this 1st operation. While the clock signal CLK which synchronized with the image synchronizing signal from the timing generation section 19 is supplied to SS duplicate prevention control signal generation section 17 Since the reset RE of the perpendicular period which synchronized with Vertical Synchronizing signal VD is supplied as a reset signal, as an SS duplicate prevention control signal S7 from this SS duplicate prevention control signal generation section 17 That by which spectrum diffusion of the duplicate prevention control signal was carried out by the PN code train which it is reset for every 1 perpendicular period, and is repeated is obtained.

[0061] Namely, it sets in the gestalt of this 1st operation. In SS duplicate prevention control signal generation section 17, as shown in drawing 5, synchronizing with Vertical Synchronizing signal VD (drawing 5 A), by the reset signal RE (drawing 5 B) which makes the 1 perpendicular section one period The PN code train (drawing 5 C) PS which the PN code train generation section is initialized, repeats 1 perpendicular period for every 1 perpendicular period, and is made into a period is generated synchronizing with a clock signal CLK. And spectrum diffusion of the duplicate prevention control signal S6 is carried out by this PN code train PS, and SS duplicate prevention control signal S7 is generated.

[0062] SS duplicate prevention control signal S7 acquired from SS duplicate prevention control signal generation section 17 as mentioned above is supplied to D/A converter 18, is made into the analog SS duplicate prevention control signal S8, and is supplied to an adder unit 15.

[0063] An adder unit 15 forms analog video-signal S9 superimposed on the analog SS duplicate prevention control signal S7 in response to the analog video signal S5 from

D/A converter 14, and the analog SS duplicate prevention control signal S8 from D/A converter 18, and outputs this. And analog video-signal S9 superimposed on this analog SS duplicate prevention control signal S8 is supplied to the monitor receiving set which displays an image, the recording device which records a video signal on a record medium.

[0064] Drawing 6 indicates relation with a video signal to be a duplicate prevention control signal by the spectrum in the example of the main *****. There is little amount of information by which a duplicate prevention control signal is included in this, it is the signal of a low bit rate, and as shown in drawing 6 (a), it is the signal of a narrow-band. If spectrum diffusion is performed to this, it will become the signal of broadband width of face as shown in drawing 6 (b). At this time, spectrum diffusion signal level becomes small in inverse proportion to the expansion ratio of a band.

[0065] Although this spectrum diffusion signal S6, i.e., SS duplicate prevention control signal, is made to superimpose on an information signal by the adder unit 14, it is made to make SS duplicate prevention control signal S6 superimpose in this case, on level smaller than the dynamic range of the video signal as an information signal, as shown in drawing 6 (c). Thus, degradation of a main information signal can be prevented from almost being generated by superimposing. Therefore, when the video signal with which it was superimposed on SS duplicate prevention control signal is supplied to a monitor receiving set and an image is reproduced, there is almost no effect of SS duplicate prevention control signal, and a good playback image is acquired.

[0066] If the spectrum back diffusion of electrons is performed on the other hand in order to be a record side and to detect SS duplicate prevention control signal so that it may mention later, as shown in drawing 6 (d), SS duplicate prevention control signal will be again restored as a signal of a narrow-band. By giving sufficient band diffusion coefficient, the power of the duplicate prevention control signal after the back diffusion of electrons exceeds an information signal, and becomes detectable.

[0067] In this case, since SS duplicate prevention control signal on which the analog video signal was overlapped is superimposed in the same time amount as an analog video signal, and the same frequency, in replacement of a frequency filter and simple information, deletion and correction are impossible for it.

[0068] Therefore, SS duplicate prevention control signal on which the video signal was overlapped is not removed, and equipments, such as a monitor receiving set and a recording device, can be certainly provided with SS duplicate prevention control signal. And according to this information output unit 10, by the duplicate prevention control signal adjunct 13, spectrum diffusion is a different method and the duplicate prevention control signal which is not removed in the condition of having returned to the analog video signal, either is superimposed on SS duplicate prevention control signal in piles. For this reason, the dependability of duplicate prevention control improves compared with the duplicate prevention control system only by SS duplicate

prevention control signal.

[0069] In the example of the information output unit of drawing 1 , after changing the decrypted video signal into an analog signal, SS duplicate prevention control signal S7 by which D/A conversion was carried out was superimposed on the analog video signal concerned. However, after the information output unit 10 adds the digital signal from the duplicate prevention control signal adjunct 13, and the digital SS duplicate prevention control signal S7 from SS duplicate prevention control signal generation section 17 by the digital adder unit, you may make it obtain analog video-signal S9 superimposed on SS duplicate prevention control signal by changing the addition output into an analog signal with a D/A converter.

[0070] Moreover, although the timing generation section 19 extracts a synchronizing signal from the analog video signal from D/A converter 14 and generated various timing signals, it can generate various timing signals from the output signal of the decryption section 12, or the output signal of the duplicate prevention control signal adjunct 13.

[0071] Next, the recording device which records information is explained in response to supply of the output signal from the above-mentioned information output unit 10.

[0072] Drawing 7 is drawing showing the example of a configuration of an example of the recording device 20 used by the information duplicate prevention system of the gestalt of this operation. This recording device 20 is equivalent to the recording system of DVD equipment in the gestalt of this 1st operation.

[0073] The recording device 20 of the gestalt of this operation is equipped with A/D converter 21, the coding section 22, the write-in section 23, the duplicate prevention control signal detecting element 24, SS duplicate prevention control signal detecting element 25, the timing generation section 26, and the duplicate control section 27 that controls authorization/prohibition of a duplicate as shown in drawing 7 . Moreover, a disk 200 is DVD in which a video signal is written by the recording device 20.

[0074] A/D conversion of the analog video-signal S9 supplied to this recording device 20 from the information output unit 10 is carried out by the A/D-conversion circuit 21, and it is supplied to the coding section 22, the duplicate prevention control signal detecting element 24, SS duplicate prevention control signal detecting element 25, and the timing generation section 26 as a digital video signal S21.

[0075] In response to supply of the digital video signal S21, an image synchronizing signal is removed, or the coding section 22 performs coding processing of carrying out the data compression of the digital video signal, forms the digital video signal S22 for record, writes this in, and supplies it to the section 23.

[0076] In the case of this example, the duplicate prevention control signal detecting element 24 extracts and decrypts the duplicate prevention control signal inserted in the perpendicular blanking period in a video signal. And the data judging about the contents of duplicate control which the duplicate prevention control signal concerned

directs is performed, and the judgment result S24 is supplied to the duplicate control section 27. In this example, this judgment result S24 is a count of a duplicate permitted.

[0077] SS duplicate prevention control signal detecting element 25 performs reverse spectrum diffusion, and has a function as a reverse spectrum diffusion-process means to extract the duplicate prevention control signal on which the digital video signal S21 is overlapped. The initiation timing of generating of the PN code train for the back diffusion of electrons used for reverse spectrum diffusion is controlled by the reset signal of the timing signals from the timing generation section 26 to mention later.

[0078] As mentioned above, in the information output unit 10, it synchronizes with the Vertical Synchronizing signal in a video signal, the PN code train PS is generated based on the reset signal RE which makes the 1 perpendicular section one period, and spectrum diffusion of the duplicate prevention control signal train is carried out using this PN code train PS.

[0079] For this reason, also in a recording device 20, it can perform easily making the PN code train for the back diffusion of electrons of the same timing as the PN code train PS for diffusion generate by generating the PN code train for the back diffusion of electrons used for reverse spectrum diffusion for every 1 perpendicular section based on the Vertical Synchronizing signal in the video signal supplied from the information output unit 10.

[0080] The timing generation section 26 of the recording device 20 of this example is equipped with the same configuration as what was shown in above-mentioned drawing 2, generates the reset signal RE1 which controls the initiation timing of generating of a clock signal CLK1 and the PN code train for the back diffusion of electrons based on the Vertical Synchronizing signal of input signal S9 of this recording device 20, and supplies this to SS duplicate prevention control signal detecting element 25.

[0081] In this case, the reset signal RE1 obtained from the timing generation section 26 is a signal corresponding to the reset signal RE used in SS duplicate prevention control signal generation section 17 of the information output unit 10, and is a signal of a perpendicular period. Therefore, the reset signal RE1 obtained from this timing generation section 26 is a signal which synchronizes with a reset signal RE, and can be made into the signal for making the PN code train for the back diffusion of electrons generate from that head. For this reason, unlike the case where it is the general spread spectrum in which synchronous timing does not exist, in SS duplicate prevention control signal detecting element 25, the phase control of the PN code for the back diffusion of electrons using slide correlator etc. becomes unnecessary.

[0082] Although SS duplicate prevention control signal detecting element 25 of this example is not illustrated, it is equipped with the back-diffusion-of-electrons section which takes out the duplicate prevention control signal by which spectrum diffusion was carried out from the supplied digital signal S21, and the data judging section

which restores the duplicate prevention control signal taken out by this back-diffusion-of-electrons section to the original duplicate prevention control signal.

[0083] The back-diffusion-of-electrons section is equipped with the PN code generator and multiplication circuit for the back diffusion of electrons, and generates the PN code train of a perpendicular period according to the reset signal which synchronized with Vertical Synchronizing signal VD in the timing signal from the timing generation section 26. And using the generated PN code train, reverse spectrum diffusion is performed and a broadband and the duplicate prevention control signal made into the signal of a low are extracted from a signal S21 as the original narrow-band and a signal of a high level. The contents of duplicate control the duplicate prevention control signal concerned instructs the extracted duplicate prevention control signal to be in the data judging section are judged, and the judgment result S25 is supplied to the duplicate control section 27. In this example, this judgment result S25 is a count of a duplicate permitted.

[0084] The duplicate control section 27 forms the control signal S27 for controlling the write-in section 23 based on the judgment results S24 and S25, writes this in, and supplies it to the section 23. A control signal S27 is a thing to the disk 200 of a video signal which also performs updating control of a duplicate prevention control signal at the time of write-in authorization while controlling authorization or prohibition of writing.

[0085] The write-in section 23 updates the contents of the duplicate prevention control signal, and records them as additional information while it writes the digital video signal S22 from the coding section 22 in a disk 200, when the control signal S25 from the duplicate control section 25 is what permits a duplicate. The renewal of the contents of the duplicate prevention control signal is decreasing the count of duplicate authorization. When a control signal S27 is what forbids a duplicate, it is made not to write the digital video signal S22 in a disk 200.

[0086] In this case, originally the judgment result S25 from SS duplicate prevention control signal detecting element 25 must be the same as the judgment result S24 from the duplicate prevention control signal detecting element 24. However, when one of duplicate prevention control signals has been removed or corrected in the process to the input to a recording device, the case where the judgment result S24 differs from the judgment result S25 arises. In the duplicate control section 27, such mismatching is adjusted and it is made to perform always suitable duplicate control.

[0087] Drawing 8 is the flow chart of processing by this duplicate control section 27.

[0088] That is, in the duplicate control section 27, the judgment result of the duplicate prevention control information on which it is first superimposed by two or more different methods in step 301 is acquired. Next, the minimum value K of the count of a duplicate permitted among two or more judgment results which progressed to step 302 and were acquired is judged. And when the value of the minimum value K is 0, it progresses to step 305 and the write-in actuation to the disk 200 of the digital

data in the write-in section 23 is forbidden.

[0089] While with [the minimum value K] one [or more] as a result of a judgment at step 302 progressing to step 303 and being made to perform record on the disk 200 of the digital data in the write-in section 23 Progress to step 304, and should reduce only once the count which can be reproduced and the contents of control of a duplicate prevention control signal are further progressed to step 305. The duplicate prevention control signal whose count which can be reproduced decreased only once [this] is recorded on a disk with digital data as addition data.

[0090] You may insert possible [area division], and spectrum diffusion is carried out and you may make it record into image data as a recording method of this duplicate prevention control signal, as mentioned above. Moreover, like ****, even if it records the updated duplicate prevention control signal concerned by two or more kinds of approaches, it is easy to be natural.

[0091] Although it was supplied to SS duplicate prevention control signal detecting element 25 in the recording apparatus 20 of the example of drawing 7 after changing input signal S9 into a digital signal with A/D converter 21, detection of SS duplicate prevention control signal can be performed also from analog signal S9. Moreover, the timing generation section 26 can also extract a synchronizing signal from analog signal S9, and can generate various timing signals, such as a clock and a reset signal.

[0092] Although the duplicate prevention control signal was superimposed with the gestalt of operation beyond [the gestalt of the 2nd operation] with other methods which are not spread spectra while carrying out spectrum diffusion and superimposing a duplicate prevention control signal on the information signal of the condition of an analog signal, it is possible to superimpose a duplicate prevention control signal on two or more kinds by spectrum diffusion. The gestalt of the 2nd operation is an example in this case.

[0093] Drawing 9 shows the example of the information output unit 30 in the case of the gestalt of this 2nd operation.

[0094] In this example, although it is the same as that of the information output unit 100 of the gestalt of the 1st operation to extract the duplicate prevention control signal S6 in the duplicate prevention control signal extract section 16 out of the digital data S2 read from the disk 100 by the read-out section 11, in this example, the extracted duplicate prevention control signal S6 is supplied to the multiplication circuits 33 and 34 for the 1st and the 2nd spectrum diffusion.

[0095] The 1st PN code sequence PS 1 from the 1st PN code sequence generating section 31 is supplied to the multiplication circuit 33, and the 2nd PN code sequence PS 2 from the 2nd PN code sequence generating section 31 which generates the PN code of a sequence which is different in said 1st PN code sequence PS 1 is supplied to the multiplication circuit 34. Therefore, SS duplicate prevention control signal by which spectrum diffusion was carried out independently is acquired from the multiplication circuits 33 and 34 according to each PN code sequence PS1 and PS2.

[0096] After being changed into an analog signal by D/A converters 35 and 36, respectively, these SS duplicate prevention control signal is supplied to an adder unit 15, is superimposed by the analog video signal from D/A converter 14, and is outputted to a recording device. In the case of this example, the duplicate prevention control signal adjunct 13 in the case of the gestalt of the 1st operation is unnecessary. Most, this adjunct 13 can be formed and it can also consider as the superposition method of three kinds of duplicate prevention control signals.

[0097] Similarly [in this example / of the gestalt of the 1st operation of the above-mentioned], with the timing signal from the timing generation section 19, the 1st and 2nd PN code sequences PS1 and PS2 are made into the PN code of the repeat of a perpendicular period which synchronized with the Vertical Synchronizing signal, respectively, only generate the reset signal which synchronized with the Vertical Synchronizing signal at the time of the back diffusion of electrons, and can obtain easily the PN code for the back diffusion of electrons.

[0098] Drawing 10 receives the signal from this information output unit 30, and shows an example of the recording device 40 with which duplicate control is performed.

[0099] That is, in the case of this example, SS duplicate prevention control signal detecting elements 41 and 42 are formed in a recording device 40, and the timing signal from the timing generation section 26 is supplied to these SS duplicate prevention control signal detecting elements 41 and 42, respectively.

[0100] SS duplicate prevention control signal detecting elements 41 and 42 are equipped with the 1st PN code sequence generating section 31 of the information output unit 30 and the 2nd PN code sequence generating section 32, and the same PN code generating section, respectively. And those PN code generating sections are initialized by the timing signal which synchronized with the Vertical Synchronizing signal from the timing generation section 26, a PN code sequence equal to the 1st and 2nd PN code sequences PS1 and PS2 is generated in the same phase as the time of spectrum diffusion, this performs reverse spectrum diffusion, a duplicate prevention control signal is restored, respectively and data distinction is carried out. And the data distinction results S41 and S42 are supplied to the duplicate control section 27.

[0101] Like the case of the gestalt of the 1st operation, about the distinction results S41 and S42, adjustment processing is performed and the duplicate control section 27 performs suitable record prohibition control and write-in control completely the same with having mentioned [which was mentioned above] above to the write-in section 23.

[0102] the PN code of a different sequence as mentioned above is not used, but one kind of PN code is generated in a different phase -- making -- ***** -- you may make it use the PN code of a phase

[0103] Moreover, in the gestalt of the above-mentioned 1st and the 2nd operation, although the PN code of an M sequence was used, it cannot restrict to this and

various kinds of diffusion signs, such as a sign of a Gold sign sequence, can be used. [0104] Moreover, it may be made to generate the object for diffusion, and the PN code train for the back diffusion of electrons for every two or more perpendicular section like [for not only when generating for every 1 perpendicular section, but every 2 perpendicular sections, and every 4 perpendicular sections], and the 1 perpendicular section is divided into plurality and you may make it generate it as mentioned above for every 1 division section and two or more minutes rate sections of every like [for every every 2 perpendicular sections / 1 / 4 perpendicular sections].

[0105] Moreover, an image synchronizing signal is not restricted to a Vertical Synchronizing signal, and you may make it a Horizontal Synchronizing signal used for it. Also in this case, it may be made to generate the object for diffusion, and the PN code train for the back diffusion of electrons for every two or more level section, and the 1 level section is divided into plurality and you may make it generate it for every 1 division section and two or more minutes rate sections of every.

[0106] Moreover, although the above example is the case where an information signal is a video signal, this invention is applicable to duplicate prevention control of all the information that the demand which prevents the duplicate of an audio signal or others produces.

[0107] Moreover, if a specific timing synchronizing signal is set up and a PN code is generated synchronizing with it when an information signal is not a video signal, detection of the PN code for the back diffusion of electrons at the time of the back diffusion of electrons is easy like ****. but -- since -- also ****(ing) -- it is easy to be natural even if it is the method which needs to set up a synchronizing signal and it is not necessary to make generate a PN code, and performs phase control and carries out the back diffusion of electrons with a slide correlation technique etc. like the usual approach at the time of the back diffusion of electrons.

[0108] Moreover, it cannot be overemphasized that this invention can be applied by the write-in section in the above example also when recording in the state of an analog signal although the video signal was recorded on the disk in the state of the digital signal. In that case, while carrying out spectrum diffusion of the duplicate prevention control signal updated as mentioned above, superimposing on an analog video signal and recording by the write-in section 23, it is good to be made to carry out superposition record of the duplicate prevention control signal similarly updated by other analog superposition methods.

[0109] Thus, since the duplicate prevention control signal by which spectrum diffusion was carried out, and the duplicate prevention control signal of other methods are transmitted to a recording device 20 also when it reproduces not with the information output unit 10 mentioned above when the duplicate prevention control signal was recorded on two or more kinds by the record medium but with the usual regenerative apparatus, in this recording device 20, suitable duplicate prevention control will be

performed like ****.

[0110] Moreover, although the above explanation explained the information output unit in case duplicate prevention control information is beforehand recorded on the record medium in the form of the digital signal, this invention is applicable also to the information output unit which reproduces the record medium with which the negative duplicate preventive measures by the AGC method and APC method which the information currently recorded on the record medium is analog information, and were mentioned above are given, and outputs information.

[0111] That is, when it has the generating section of a duplicate prevention control signal, for example, the false synchronizing signal of the large amplitude for the above-mentioned AGC method is detected, an information output unit generates this duplicate prevention control signal, and it carries out spectrum diffusion of this, superimposes it on an analog output information signal, and it is made to output it as mentioned above in that case. Also when the duplicate prevention control signal is not recorded, duplicate prevention control can be made to ensure to a record medium, if it does in this way.

[0112] Even if similarly it is the record medium with which information is recorded in the form of the digital signal and copyright information is recorded as additional information Also in the information output unit reproduced in the record medium with which direct duplicate prevention control information is not recorded When said copyright information as additional information is detected on the occasion of playback If a duplicate prevention control signal is generated, and spectrum diffusion of this is carried out as mentioned above, and it superimposes on an analog output information signal and is made to output, the duplicate prevention control in a recording device can be made to ensure in the case of analog connection.

[0113] Moreover, although it explained the case where a duplicate prevention control signal was superimposed on a duplex, even if the above example superimposes a duplicate prevention control signal on two or more kinds more than 3-fold and it, it is easy to be natural [the example].

[0114] A duplicate prevention control signal is not the count of a duplicate permitted, and it cannot be overemphasized that only duplicate authorization, the ban on a duplicate, and the 1st-generation duplicate can be applied even if the contents of control, such as a generation limit of authorization etc., are shown.

[0115]

[Effect of the Invention] As explained above, since duplicate prevention control information is superimposed to the main information signal with two or more kinds of superposition methods, even if the duplicate prevention control information by some methods of them one will be removed or correction is added, if at least one duplicate prevention control signal remains, by this invention, duplicate prevention control will be performed certainly. Especially, in this invention, by carrying out spectrum diffusion of the duplicate prevention control signal, one of two or more superposition methods

extends a frequency band, it is a method made to superimpose within the same time amount as an analog information signal, and the same frequency, and the deletion and the correction of duplicate control information of it become impossible by replacement of a frequency filter and a simple information signal. For this reason, even if it is analog connection, duplicate prevention control can be performed effectively.

[0116] And since a regulation is defined and adjustment is made to plan when either of two or more duplicate prevention control signals is corrected and mismatching arises among said two or more duplicate prevention control signals as the duplicate prevention control information nearest to the ban on record is adopted, duplicate prevention control is performed appropriately.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is a block diagram for explaining the gestalt of 1 operation of the information output unit by this invention.

[Drawing 2] It is a block diagram for explaining some information output units of drawing 1 .

[Drawing 3] It is a block diagram for explaining some information output units of drawing 1 .

[Drawing 4] It is a block diagram for explaining an example of a part of PN code train generation sections of drawing 3 .

[Drawing 5] It is drawing showing the timing chart for explaining the gestalt of operation of drawing 1 .

[Drawing 6] It is drawing having shown the relation between SS duplicate prevention control signal and an information signal by the spectrum.

[Drawing 7] It is a block diagram for explaining the gestalt of 1 operation of the recording apparatus by this invention.

[Drawing 8] It is a flow chart for explaining actuation of the important section of the gestalt of 1 operation of the recording apparatus by this invention.

[Drawing 9] It is a block diagram for explaining the gestalt of other operations of the information output unit by this invention.

[Drawing 10] It is a block diagram for explaining the gestalt of other operations of the recording apparatus by this invention.

[Drawing 11] It is a block diagram for explaining the conventional configuration of a duplicate prevention control system.

[Description of Notations]

10 [-- Duplicate prevention control signal adjunct,] -- An information output unit, 11 -- The read-out section, 12 -- The decryption section, 13 14 -- A D/A converter, 15 -- An adder unit, 16 -- Duplicate prevention control signal extract section, 17 -- SS duplicate prevention control signal generation section, 18 -- A D/A converter, 19 -- Timing generation section, 20 [-- The write-in section,] -- An information recording device, 21 -- An A/D converter, 22 -- The coding section, 23 24 -- A duplicate prevention control signal detecting element, 25 -- SS duplicate prevention control signal detecting element, 26 -- The timing generation section, 27 -- A duplicate control section, 30, an information output unit, 31 [-- 41 An information recording device, 42 / -- SS duplicate prevention control signal detecting element, 171 / -- The duplicate prevention control signal generation section, 172 / -- The PN code train generation section, 200 / -- Record side record medium] -- The 1st PN code sequence generating section, 32 -- 33 The 2nd PN code sequence generating section, 34 -- The multiplier for spectrum diffusion, 40
